JULIAN BEINART: The piece that I've had handed out to you covers the trajectory that we will follow from 1 to 7. Let me make a comment about the formal structure of these examples.

The grid is a universal language. It is used in the cosmic model in Xi'an in 190 BC. And it's used in the 1811 Manhattan extension plan. The assumption is, if one takes this too literally, is that the grid is a language which can perform its function in almost any context.

That is possibly true. In each case, it requires one to ask questions about the nature of the grid-- its context, its size, its manifestation, what the contemporary culture was attempting to produce. The commissioners who laid out the 1811 Plan for Manhattan spoke in terms of trying to create the most everyday environment they could. What does every day mean to them?

They're the examples of New Amsterdam, the Dutch settlement, and the British settlement, which followed. Wall Street, by the way, was the separation between the English and Dutch settlements.

So the explanation for the centralized cosmic order of Xi'an and the same or similar use of a grid in Manhattan many years later with this second set of plans or plans for grids of many European center cities. They're all grids, but infinitely varied in size and dimension.

The diagram is that of a Bastide town in the southwest. This one happens to be a town which divides the blocks up according to a diagonal measurement. I'll deal with that move more carefully.

The next is a diagram, a fictitious diagram, of a Roman town showing the rectangularity which exists around the tying of a central knot by this subdivision of the blocks according to a horizontal east-west line and this north-south line, the Decumanus and the Cardo.

And the second last-- the last is an example of contemporary fascination with linearity following the notion of machine performance.

Henry Ford who probably advocated assembly line production more than any other industrialist in modern times when he wanted to make his own city in Muscle Shoals in Alabama, didn't use a linear system. Well, maybe-- there are very few plans of Muscle Shoals. But it was a long city which really interfaced agriculture and industry.

Ford's notion was that America had gone wrong in building industrialism without agriculture. He's postured it for Muscle Shoals, which I'll discuss later in this class. It's interesting. Every person-- Henry Ford said, anybody who works for me should spend part of his time in a garden or in a creative agricultural performance of some kind.

The example on the second to last page, Southwest Washington in plan, and our first notion that the city should be made up over time by points of interest based on the topography and on a diagonalized system of connection was opposed by Jefferson. Jefferson made an earlier plan which is very difficult to decipher but is longitudinal and rectangular.

L'Enfant is quoted here as saying, how boring a grid plan is. "Grid plans are tiresome and insipid, however, answerable they may appear on paper or seducing as they may be on first aspect to the eyes," compared to Alexandria in 77, which was a rectangular plan, which was occupied right from the beginning and worked subsequently very well.

So one of the aspects of the machine model, which this seems to suggest, is that it has a very high speed of return. You can have a plan in an extreme situation, which requires a minimal amount of surveying. It has a high aspect of legibility.

According to Gestalt's theorist of urban form, they would say that it's because there is only one angle in a right angle intersection. Any other intersection involves more than one angle. And the basic fundamental law of visual economy, would suggest that you would prefer the security of the right angle. That is a linguistic assumption. And it's probably got a meta truth associated with it. It's not the only reason that this grid form appears in the machine model.

The cosmic model, which we discussed last time, put forward the ideal of a crystalline city, stable and hierarchical, a magical microcosmos in which each part was fused into a perfectly ordered whole. If it changed at all, it did so only in this mechanical-- not in mechanical-- rhythmical, ordered, completely unchanging way.

Thinking of the city as a practical machine on their own is an utterly different conception. A machine also has permanent parts, but the parts move and move each other. The machine can change, although it does so in some clearly predictable way. Stability is inherent in the parts, not necessarily in the whole.

A whole grows by addition. The wider meaning is simply the sum of its parts. It can be taken apart, put together in reverse. Its pieces can be replaced.

It is factual, functional, cool, not magical at all. This is a very basic statement, that you can arm machine with magical properties is perfectly possible for the human brain. We will see in the later examples where, in fact, this is an aspect of the machine model which appears much later. In its earliest times, it's very pure.

The machine model occurs historically most often when its settlements are temporary, secondly when they have to be built in haste or being built for clear, limited practical aims. The expansion of Manhattan North of Houston Street invoked no magical properties. When the Rockefellers intervened and built Rockefeller Center, there was some sense they did so partly, historians claim, to maintain the hegemony over that part of Manhattan where their house was.

Rockefeller Center can be seen to fit into the overall machine-like system of Manhattan, yet on its own it evokes larger cultural invocation. We'll talk more about that as we talk later on in this class about some of this. I said, it's most useful in temporary situations when the environment is built in haste, when it's built for clear of limited practical purposes. But it's also used to allocate land and resources quickly. There's a kind of built-in idea of equal distribution in mind as well.

You'll recall Marx's comment which I made at the beginning of the class about the emerging distinction between country and city. What emerges as urbanization occurs is increasing gap in land value between anything that's urbanized and anything that ruralized.

To pay back the enormous investment in labor, the Romans, for instance, paid back veterans who served in the army by land. It needed to subdivide the land in an equitable fashion. The word in English "lot," it refers to a plot of land has the same root as the word lottery. The lottery was used quite extensively in this equalization.

So the machine model becomes a checkerboard in some sense in which you can give people the promise of land value, but you cannot exactly initiate a central point. There may be a central point the crossing of the Cardo and Decumanus, but that would be reserved for the Roman Forum, not for private land.

In the Laws of the Indies, Los Angeles, the last of the Laws of in the Indies cities in the United States, the Central Plaza was 200 by 400 feet. And then the grid spread out from that. So this notion of a democratic distribution of urban land is fundamentally in the process of urbanizing at low cost-- conditional low cost. The cosmic model required enormous investments in defense.

The first set of examples we look at are the Egyptian slave quarters built to promote the eternal life of the pharaonic cult. For reasons which are rather obscure, Egypt was not accompanied. Egypt's development from 3,000 BC onwards didn't involve internecine warfare, which meant that no investment need to be made in wars to defend a local site.

Once you invest in the local site and pay for the cost of fortification, you don't move. Cairo was a much later phenomenon. In the 3,000 years until about 600 BC, there were no cities in Egypt. Thebes and Memphis were only temporary cities. They were built to enable the construction of the metamorph-- not metamorphosis-- the metaphysical structures for the post-life of the pharaoh.

It took so much human labor to build one of these cosmic structures that the idea of labor and cost and materials didn't go into anything which we would describe as a normal city. It went instead into the business of construction and the environment for the afterlife. Yet that piece of the pharaonic complex, which housed the laborers, were based on a per striga system of block development, which we'll show you in the slide.

But--

AUDIENCE: I have a question there.

JULIAN BEINART: Yes.

AUDIENCE: If I wanted to make of these cities the amount of resources that you have invested, both in time and effort, that cements the population [INAUDIBLE]

JULIAN BEINART: Sure, sure.

AUDIENCE: [INAUDIBLE], how does it work in cities like-- I'm thinking of Teotihuacan in Mexico, Fatehpur Sikri in India, that for this vast complex that eventually they--

JULIAN BEINART: Both of them disappeared. Fatehpur Sikri disappeared because of a fundamental problem of water, a miscalculation of the amount of salt in the water, which caused the city to be-- prior to modern times few cities have disappeared. Fatehpur Sikri is one of them. Teotihuacan under Mexican rule became a tourist artifact.

The Aztec religion was no more fundamental after the Spanish hegemony. So it lost its fundamental purpose. We don't lose citizens easily anymore. And that is an argument will come about later in this class.

But bear in it mind, the death of cities is really a phenomenon of pre-modern times. And both examples you give, in the one lost its fundamental mechanical system. Salty water is no longer the basis for a wonderful town that Fatehpur Sikri was.

And Teotihuacan didn't have an adaptive mechanism to sustain its growth. It was no reason for it to grow. Tenochtitlan, on the other hand, had all of the capacity as a capital city on the lake. The combination of the mysterious quality of the original-- of the landing of the eagle in the center of the cosmos.

That was taken over as an astronomic-- anyway, we'll talk more about this. You raised an interesting argument.

According to the fifth century Greek historian Herodotus told-- I don't know how he knew this, but 100,000 men were engaged for three months each year for 20 years in moving blocks of stone to a pharaonic site. He claims that there must have been something like 4,000 workers which had to be housed permanently.

So Leonard Woolley the archaeologist writing about Tell el-Amarna describes the housing as monotonously alike, each with its kitchen parlor in front, its cupboards and bedrooms behind, the very patina of mechanically devised industrial building. Same arguments made by other archaeologists.

The distinction between enslavement of labor and cultic objectives is characteristic of this Egyptian phenomenon. A more elaborate system of using the machine model takes place in Hellenistic towns. In colonial situations, it's very unlikely that the mother city will be replicated in the colonial system.

Delhi is not like London. The Laws of the Indies towns, Bogota, is not like Madrid. Athens had its own unique structure. It was an Iraqi site. It had limited agricultural resources. And it needed to expand as part of its Mediterranean expansion to the south to Africa, to the east to Asia Minor, and to the west eventually to Sicily and to Southern Italy.

The building of colonial empire took place not because of the advantages of the mother city. In fact, fifth century democracy in Athens is unlikely to have been spread. There's one theory that says the Greek islands or the Greek colonial sites-- not islands-- were the result of the expansion of democracy.

Democracy only occurred in the first century BC. The colonial expansion of the Greeks prior to that, the most important of the colonial towns, the grid-like towns, was built in 479 by the planner Hippodamus, who had a stutter, he had long hair, and had interesting political theories. He discovered the method of dividing cities and cut up Pireas. He's also known by some historians as the inventor of the gridiron and the father of town planning.

Hippodamus, 479, Miletus-- this was the first time that a town was considered as a totality in a certain sense. All the parts of the town were in place, except perhaps for industry. One doesn't know from archaeology how much industry took place in these colonial times. They were essentially trading towns.

Mumford argues that the grid serves as a method for making form of clarity of international trade. There's something to be said for having a recognizable or legible environment as you move into new environments. You put your stamp on a place. It's almost like building a Hilton Hotel, which hardly serves to emulate the environment or to affect the environment.

But Mumford's argument is that modern trade requires a standardization of commodity. He later on, in talking about American grid of expediency, refers to capitalism and the grid of expediency as phenomenally correct and absolutely connected. Whether this is true, we will discuss as we go through this class.

There's no absolute connection between capitalist theory and grid phenomena. I'll speak to this point a bit later in this class.

The other towns of distinction were Olynthus in the Northern Greek peninsula. Oh no, it's not on the peninsula-- it's further north, north of Athens. And Priene, 300 BC. All of these involve the same phenomena shaped within the grid. And agora, a wall, a wall didn't conform to the grid-like system. These towns were built on defensible sites so that the wall system was informal and took account of the minimum ways of building infrastructure on sloping land.

The British architect Peter Smithson in a talk on the BBC once argued against the classical vocabulary of Greece. He of course, is an architect who very interested in informalism. And he argued that one should really look at the Greek fortifications as a structure for one's intellectual heritage rather than the classical system of the Greeks. Cartilaginous whether he's right or wrong, and he won't tell us.

There is no central axis made by the intersection of major axis. The agora was at the center. The grid was exemplified, again, as a grid of absolute equality.

These towns have had lives beyond the Greek time. They were taken by Hellenism, by Romans, and most of them disappeared. They couldn't withstand-- the requirements have changed. Greece was replaced as a power in the Mediterranean and [INAUDIBLE] disappeared.

But I have referred to Mumford. He says, I quote, "a new regularity and system in commercial affairs causes a formal order that when you are faced with the presence of a hill or curved bay, there's no effort to adaptation for change of pattern."

A similar phenomenon occurs in the Roman Empire. I'm just going through these things very quickly because we're limited in time. Each of these examples has a literature available. If any of you want to follow the particular literature involved, just send me an email and I'll send you the references. It's impossible in a class like this to go into the details more than the general description.

You have to assume that the generalizations are correct. It's my fault if they wrong. Built cities in an empire-- there was no empire to the extent in the world's history prior to the Roman Empire, not in scale.

The Romans built something like 5,627 towns. Towns were often at the intersection of important points. Her empire stretched from Scotland to Slovakia to the Middle East to North Africa. Again, some of the same phenomena occurred.

Timgad, the great Roman town in North Africa, is a town for veterans. It's subdivided into equal blocks to repay veterans for service.

There are two characteristics of a Roman town. Again, the same phenomenon of the commercial order, of an international commercial order, creating the logic for formal order or local formal order.

Germanicus, the Roman, general says, "I can feel I'm still in Rome if I journey from London or the beginning of London, Londinium, to Rome." The poet Rutilius Namatianus says, "a city of the far flung Earth you have made."

So there are two compunctions in the Roman city. The one is to create a locus, a place of significance, much like a camp. For that already the connections to the space outside of the town is made by emphasizing the Cardo and Decumanus system.

We have the Greek town, much like the magical town before it. It was an isolated phenomenon sitting on often very complex territory, and building a wall which fitted the territory's form. And although there may be a port here, as in the case of Priene, there was no attempt to connect this to anything else. There was no empire large enough.

The Roman town was an empire town. The Cardo and Decumanus centralized in a forum and was an version of an encampment which could be built anywhere. It's the basis of London, it's the basis of Paris, it's the basis of Bratislava, it's the basis of 5,000 settlements.

That's A. And we call this castrametation, a nominal phenomenon. That is to logically extend the marking of the territory outside the town. This is called centuriation. Sorry, you can't read my handwriting-- castrametation, centuriation.

That is the measuring of land outside the town by a surveying technique using a gromaticus, a manual on utility needs how to lay out parcels of land. These were both used for agricultural purposes and also as payment for service. So the hermetic quality of the Greek colonial settlement is quite different in spirit. Every crossing was a town.

The notion of being the center of a empire is different than the metaphysics of being the center of the Earth. The one is provable, the one is not provable. The one is metaphysical, as in the cosmic model.

You'll remember my quoting Vassiliadis regarding the centeredness of the archaic world. The centeredness here is the linking. Of course, the center of Rome, with all its fora and magnificence, was the center of a fundamental system of financial distribution.

The Roman Empire was built on physicality. That is, on the learning how to tax people locally, and then feed the money back into a central place. This is the first model of colonial enterprise.

You find some wonderful reactions to it. Bellini's opera *Norma*-- has anybody seen *Norma?* You should see *Norma. Norma* is the story of the Roman occupation of the capital city of Gaul. And Norma is the local woman who leads the revolt against the Romans.

She of course falls in love with a Roman lieutenant. And both of them disappear into the God only knows what. Or if you want another invocation of the Roman city, read Shakespeare's play *Coriolanus. Coriolanus* is a bad Roman and he suffers on his attempt to return to Rome to his mother center, but fails in his attempt. OK, there's a lot to be said about the Romans.

The territory subdivided by the gromaticus is generally 6 by 6, or 36 units. And this is the circumference of land plowed by one ox in one day. I'm wanting to go through this very quickly because we have to look at some images and there's no point. I'm only trying to make a central an argument as I can about each case.

One of the arguments I'm not making is the influence of materials. The Romans were the first people to invent concrete. And the public quality of the Roman city is ascribed to the availability of concrete. For those of you interested, there's is a piece by an MIT Professor, Heather Lechtman called *Roman Concrete and the Roman Architecture Revolution.*

She argues that hydraulic setting cement was an attractive ceramic medium for a period buildings. These could be processed at ambient temperatures from readily available raw ingredients and cast into large, designated spaces. It produced integral monolithic structures, which could be incrementally extended.

The Greeks had to meet in the open space. The Jews still meet in the open space up against the Western Wall against the remnants of Herod's Temple. The Romans for the first time made it possible to enclose space and convert the spaces is no larger than about six feet enormities corridor is a very concrete phenomenon. The Pantheon is an example.

But Lechtman doesn't only refer to the Pantheon. She refers to the aqueducts, to the whole system of building public buildings at the scale that they did. The Greeks weren't great builders. They were aesthetes.

There's a thesis last year by Daniele Cappelletti who argues that the Romans enabled the beginning of what he called [INAUDIBLE] architecture-- that is, the interior of buildings. The Greeks weren't interested in interiors-- they were exterior, externalizers.

A plan of the agora doesn't follow any access. It's a jumble of things, much like the Mayan town. If you devote yourself to creating buildings which only makes sense given the exterior, what they can see or how they can be seen, you can deviate from the model that the Romans used.

The post-Roman period, we call the Middle Ages. In my learning of history, these were the Dark Ages. Nothing happened-- the world only emerged after a period of immense turmoil in Europe.

There's been recent history done on this period from 300 to 900 AD, from 400 to 880 AD, to mention two new books. There's not too much to be said. The Roman system was localized in every respect. Large families and the church took over sites from Roman camps.

The fiscal system-- there wasn't a centralized economy funding taxation into Rome, so each set up a competitive system for towns. One of the things that the Roman roads did was to allow the subsequent cultures to use the system of moving large distances.

The Christian Church took advantage of this. In the story of [INAUDIBLE] what's the town in the-- my mind has slipped-- the town I wrote about in the first reading? It's [INAUDIBLE] one of the saintly cities in Northern Spain, [INAUDIBLE] named--

AUDIENCE: Compostela

JULIAN BEINART: Compostela. Of course, it's named after James. It's got the same name as San Diego and all of the-- sorry, I try to remember too much.

Pilgrimage was made possible by virtue of the Roman roads, so was in medieval connections in commerce. A pilgrim could come to Compostela from Bulgaria, walk or take a donkey, move through France where they would stay in religious hostels, eat Coquilles Saint-Jacques, which is the food which emanates from Compostela, because Compostela is a signature in the scallop, much like shell petroleum. It adopted the scallop as its important logo.

I think the first post-medieval notion of the machine-like phenomenon occurs with the expansion in the 13th century of the French Bastide towns. Bastides is B-A-S-T-I-D-E-S. In the 13th century, the Central Royal Authority built something like 177 new towns in the French territory in the south.

Between 1241 and 1330, you have towns like Carcassonne, Beauvais, Montpensier, [INAUDIBLE]. These settlers who were asked to come and populate these towns were there because of the French authority's wish to propose to defend, imposed their will on the distant parts of the empire. They also developed as markets centers.

A grid of convenience, the quickest and most equitable way of laying out a town on a new site. The form of these towns is also grid-like. The plan differs in some fundamental respects.

The plan is a formal order which is generally orthogonal. But the plan, it doesn't follow the Roman preoccupation with a single axis. It pairs roads.

This is the central square. And where the road passes through the central square, it is arcaded. The church is generally located on a side site.

These sites was subdivided in grid fashion. There's a gate here, a gate here, there's a gate here, and there's a gate here.

And the same impulse to make it attractive for people to migrate, to pay them for the effort of migration, the state takes on the role of building the walls, and so on. Has any of you been to a town like this? Which town do you remember?

AUDIENCE: [INAUDIBLE]

JULIAN BEINART: Well, Montpensier is probably the best known. It has the most developed system of arcades. If you have any chance to visit Montpensier, do so. The wine is good.

The arcades are called cornier. And the subdivision of the land is called in French it's referred to as checkers. And popular game checkers has similar notation, formal notation, as the layout of the town.

By the way, Winston Churchill's house was named Checkers as well. Haven't the faintest idea why, but it's amusing.

The largest decentralization after the Roman occurs in the Spanish occupation of Latin America and the southern part of the United States. This is about a crude a generalization as one could make, but I'll try.

In 1494, the Meridian of Tordesillas is divided Latin America into Portuguese domain and the Spanish domain. The Laws of the Indies applies to this domain here and also to this domain here, which was part of South America at the time.

We'll talk about the grid of expediency here and the cattaneo model here. C-A-T-T-A-N-E-O-- New Haven, Savannah, Charleston. Let's makes generalizations about them.

In 1573, Philip II, understanding the military, religious, and financial availability of land in the hinterland of the Americas, created an argument or set of principles on which towns would be laid out. These are called in English the Laws of the Indies.

They describe the way you are set of rules which specify-- I'd better hurry-- the size of the individual components of the town. The main plaza was to be oriented so its four corners pointed to the four cardinal points of a compass. It shall not be smaller than 200 feet wide and 300 feet long, no larger than 800 feet long, and so on.

It had a formal message to convey to the Indians who located around where the new settlement tool place. "When the Indians see them, they will be filled with wonder." That is the church.

The Indians should not be let into this town until the church is finished. The church architecture represents the formal attribute of colonial superiority. The Indians must understand that they have been conquered by a superior race, therefore the church, which is to the Spanish the highest form of contact with God and the only formal attribute that we have other than behavior and ritual, becomes the temple of the Roman town, at least to the Laws of the Indies town.

St. Augustine, Florida was the first application of the Laws of the Indies in 1565. Los Angeles was the last of the Spanish settlements, 1781. So the period of this 1565 to 1781 takes care of many of the towns, St. Augustine.

The Anglo-American grid, which is the grid of experience to the North, overlaps with the Laws of the Indies grid in towns like Albuquerque. If you want to look further into how this structure works when the two collide, I'll give you the reference. It's a piece written by an ex-student from this class published a number of years ago.

The Portuguese Empire was left to develop according to a pattern different from the Spanish towns. The Portuguese Empire was casual. It really spent most of its presence in the Iberian Peninsula looking outwards and being dramatic, reoriented, and conquering the sea routes.

Sao Paulo, which is now one of the world's largest cities, one of the few 20 million-person cities, has its origin in nothing more than three different religious sects forming the town on a hill away from the water. Sao Paulo should have been on the water. These people made a mistake, and in competition with each other set up three points of growth in central Sao Paulo.

AUDIENCE: How do the Law of Indies apply to a city like Mexico City, because it was actually kind of established.

JULIAN BEINART: It adapted. Most of these generalizations and rules are systems of order which have to compete with the existing structure. The Greek town, had it been in the desert, would have been paid less attention to it. The Egyptian town, being on the flat land, didn't deal with topography.

The story of Mexico is a long story, and I haven't got time unfortunately to-- maybe I can send you an email about it. But the story of Mexico City. Where are you from.

AUDIENCE: I'm from Mexico.

JULIAN BEINART: Where?

AUDIENCE: So I know the story of Mexico. What I'm trying to understand is how it deviated from one standardized town the photos and another.

JULIAN BEINART: It followed it as best it could. One needs to look at Bogota or Quito to find much more pure example-- I'm sure both Bogota and Quito are much purer examples of building new towns on the basis of little competition. Mexico City was unusual. Most of the Laws of the Indies towns were new towns.

OK, let's jump. The amount of time left for discussing the influences on the laying out of most of Central-- not Central America, Central and North America-- can be found in books by John Rep's *Town Planning in Frontier America,* a number of texts.

One of the best that I would refer to is Conzen's writing. The reference isn't in this class, it's for class number 24. Conzen, a British geographer, has written very excellent stuff.

Essentially the components of the grid of expediency are the following-- number 1, the Land Ordinance of 1785 which divided the unbuilt parts of the United States, first only part of it, then finally most of the United States, into a grid of 6 by 6 miles.

Local authorities or local towns could then subdivide within this grid. Most of the subdivision was taken care of by two forces, either private development, which subdivided length into smaller units, or the railroad companies which merged [INAUDIBLE] develop [INAUDIBLE] profits hand-in-hand. The standard plan used by railroads for 33 towns developed by one group alone in Illinois.

There was another force at work, and that was the movement of religious groups such as the Mormons across this country. There were Mormons starting in 1913 up in New York. They moved to a Kirkland, Ohio, they were pushed out of there. They move to Missouri, the revelation that this is the new place. They moved out of there. They went to Nauvoo in Illinois and spent the winter quarters in 1847 in Nebraska.

And finally in 1847, after a journey of 17 years, Brigham Young said, this is the place and he developed Salt Lake City. Salt Lake City is a grid city, which has a set of micro-rules about street-- which lots can be facing the streets, and so on. I'll talk about that later.

Two people who've argued about the grid of expediency-- Lewis Mumford has called urban land becoming a mere commodity by the parceling of land a quick conversion of farmstead into real estate and a quick sale.

Richard Sennett has written in the *Conscience of the Eye* about the Protestant ethic of being satisfied with what he calls the Protestant ethic of space. "Here is where the good found its place. It was a space for economic competition to be played upon like a chessboard. It was a space of neutrality, and neutrality achieved by denying to the environment any value of its own."

This attempt to argue in this way argues that, if I buy any IBM share, I buy a piece of its typewriters-- I don't know if they still makes them-- a piece of real estate, a piece of its land. My $5 share, or $47 share, is a commodity as a reduction of a large complex whole.

The argument is that the city is a complex whole. And reducing it to a commodity by gridding it takes no account of the essential qualities of a city. There's a kind of cosmic memory associated with his critique. How capitalism developed Boston with no grid is, of course, a question I would ask Richard Sennett or Lewis Mumford.

Not all American cities were like Chicago. The cattaneo of cities on the East Coast, I have got time to-- but they essentially are best described by the *Plan of Savannah,* written very elegantly in an analysis by Stanford Anderson, who's a Professor in the Department of Architecture.

It essentially takes the grid plan and centers it into neighborhoods with parks in the center. It divides the road system into wider roads which run north-south. Why do the roads in Manhattan are wider, 100 feet wide, going north-south, and 50 feet wide going east-west? What are the roads connecting in the Rome sense? Docks, water traffic on either side of the island.

So the east-west street should have been wider than the north-south street. The north-south are avenues. Why? Let's try to answer that question in talking about the 1811 Plan. The 1811 Plan was no cosmic plan.

According to Roy Strickland's writing, it simply adapted the measurements of the British settlement, which took over the Dutch original 1623 settlement. There was a wonderful exhibition of the 1811 Plan in New York last year. I don't know if any of you saw it. Did you see it?

Pretty. It says more than I can possibly say. In the commissioner's report, it says, "we could not bear in mind that a city is to compose principally of the habitations of men, and that straight-sided and right-angled houses are the most cheap to build and the most convenient to live in, effective these plain and simple reflections are decisive."

So here we have a plan which many people have commented on, a plan which is allowed enormous subdivisional specialization, a plan which has allowed the southern sector to grow as a financial center. A central part is a part for department stores, the combination of housing and offices and commerce in the rest of the plan.

Essentially, it's a plan which [INAUDIBLE] has correctly written about as delirious. One of the advantages of a free system. There have been rules about building a Manhattan ever since, the protection of the sidewalks-- the height at which buildings get build, and so on, over time. But the central grid has remained.

It is fundamental to the grid system of New York that Central Park connects east and west. The grid system is the fundamental flexibility phenomenon of Manhattan. And it coupled with the combination of income and density produces a unique situation which we will examine more carefully later in this class.

But could Manhattan be developed on a different principle than a grid? That's asking a big question. We'd have to do different plans for that and try to assemble the conjecture that follows. We're not doing it, and it's ridiculous to do it.

The lessons from Manhattan are to be learned by virtue of reading the original plan and studying the attempts to modify it. It like many-- how are we doing? Two minutes-- like many city plans, is in a constant state of adaptation.

The Second Avenue Subway is the last of the most recent of the distortions of-- not the distortions, that adaptations to the plan, the attempt to-- Rowe Price Manhattan failed, it's probably likely to occur at sometime. The impossibility of connecting the hinterland to the center is evidenced by the fact that New York, one of the primary commercial cities of the world, has the worst international airport system of any city competitively. It's only the arrogance of New York that let's it get away with having a second rate airport system. Those of who have experienced LaGuardia and Kennedy and New Jersey and have been to great, new airports can argue for yourselves the distinction.

Carnegie Hall is one of the most uncomfortable places to listen to great music. Again, New York gets away through a kind of economic arrogance. The theory, which is highly personal to me, that is, if you develop enough economic strength, you need not follow it by making everything of the highest order. It's a stupid phenomenon, but maybe it's true.

It's only in China, which has new wealth, that people can build new airports. It's of course not totally true. But one of the major concerns about the additive quality of the Chinese city is that it is a city of addition and has lost any of the attributes of the cosmos or even the Roman camp. We will go into that some more.

The last group of slides will deal with the evocation of linearity and more modern concepts of the use of the idea of the machine. So why don't we look at them, otherwise we will just go on.

This is a long class. This is an enormous amount of stuff. I don't apologize for these first three classes. Most you haven't done enough urban history. Here are two examples. The one on the right is from Tell el-Armana. The one on the left is from Kahun 2460 BC and 320 BC.

Next. This is the town of Tell el-Amarna on the east side of the Nile built by the Pharaoh Akhenaten and occupied for only 40 years. He had a religious argument with the priest in Thebes and went across the Nile to build his new town. The yellow in the plan refers to the workers lair.

There's another story, which I haven't got time much to go into that. In Freud's writing about Moses, the book is called *Moses and Monotheism,* he talks about the connection between pharaonic Egypt and the emergence of Palestine, the sum notion that this land for Jerusalem is taken from the Dead Sea Scrolls. The sum notion that there was some connection passing on information from the Jevasites, the first occupiers of Jerusalem, or one of the first, and the Egyptians.

Next. The Greek town, Miletus-- Miletus, you can see the structure of the containing wall. The orange and darker colors of the imposition of the Romans on top of the Greek plan.

Next. OK, Priene, the main axes roads-- again north-south with minor roads east-west, and the central agora complex and temple complex and part of the central parts of the town.

The Roman road system, an extraordinary phenomenon. Just imagine at the birth of Christ or a couple of hundred years afterwards that there'd be an empire built as significantly connected as this. This gives some indication of the location of the Roman towns-- 5,627 according to one authority.

Next. castrametation, the idea of the town as being cemented by two connecting roads, a fortification around the outskirts, and the notion of a gridded system outside. It takes an enormous amount of thought to imagine a town which has a fortification having a counterpart formal order outside the town.

That is unique to the Romans. They were so conscious of the clarity of the empire that they could imagine making the land-- again, the land as opposed to the city in marks, the land as a friend of the city.

Next. Here is the 6 by 6 system of land subdivision for an ox which can perambulate in one day the layout made by a [INAUDIBLE] at the hands of a gromaticus. Here near [INAUDIBLE] in Central Italy, you can see some of the effects even today of the length of the centuriation pattern.

The city is only in existence in its relationship to this space outside it as it is condensed in its interior. It's a phenomenal idea. It's an idea which American cities have not, or modern cities, have not understood completely.

Next. Timgad, the great Roman city for veterans on North Africa. The Cardo and Decumanus here are shortened because of the location of the forum and the amphitheater.

Next. Two plans-- Verona on the right and the first attempt in a relatively Renaissance plan of Florence based on attempts to introduce a local taxation system and still respecting the Roman grid.

Next. The southwest of France-- the Bastide town, a pair of towns. The cornier in the center, the church on the side.

Next. [SPEAKING FRENCH] Here you see something interesting geometrically. The blocks as they go further from the center have the horizontal length based on the diagonal of the previous. So the blocks get bigger as you go out. It's a geometric trick. Here it is.

Next. [INAUDIBLE] the great town on the Mediterranean, clearly in prismatic. This served is one of the launching points for many crusades to Christianize Jerusalem. And here's [INAUDIBLE] one of the roads running through the central plaza, a cornier system of creating a greater pedestrian opportunity in the center. It's like building a permanent arcade around the center.

Next. Here's the Meridian of Tordesillas-- the Spanish world and the North American world. Here's a typical Laws of the Indies town. I think it's Caracas central plaza.

Next. In contrast, the development of the typical Portuguese town, as you can see from its early stages, has developed long strips.

Next. Again, this is-- thank you. This is a thesis done on examining the Laws of the Indies in detail. It's a thesis here at MIT by Guillermo Frontado. He looks at the streets at the plazas and interprets the laws in formal terms-- what distances they occupy, what sections they produce, and so on.

Next. So here is the subsequent development of two central capital Latin American cities based on the Laws of the Indies. Here are the major churches on the central plaza. Here you see the adaptation of the central plaza theme in subsequent decentralized plazas.

Next. Subdivision of the 6 by 6 mile 1785 system.

Next. Salt Lake City, Harrington, Kansas-- built the railway company.

Next. Chicago, which we'll deal with in some detail later on. And Burnham's Plan 1907, 1905 Plan to centralize the grid of Chicago. It's an extraordinary plan, diagonalizing the grid towards the center. It's kind of attempt cosmetize Chicago.

Next. 1811 Plan. Again, this is out of focus. Now, why then change this. The story of Central Park is another story.

Next. The inevitable connections of the east and west, maintaining the grid, while still producing a major public garden.

Next. The cattaneo model-- that is, dispersing open space throughout the system and having different widths of roads is part of the system.

Next. Savannah, Georgia-- still a marvelous town, and a town which resisted here. There's a book called the *Night of Garden.* What's the book? Anybody know the book? Which talks about Savannah's decision not to take large companies, like insurance companies as headquarters because of their attempt to keep the local system.

Next. And a few of the modern examples. This is Soria y Mata, the Spaniard's plan for linearizing the outskirts of Madrid, a linear model being a very popular model, taken essentially from a mass fabrication system.

Next. [INAUDIBLE] the affirming steed, the magnificent steed, the superb steed. The engine of the express train, the steam engine which people went to see. And the Ascoral Plan, which Corbusier was one of, 1940, a plan to link Europe, to linearize Europe.

Next. Captain [? Chambliss's ?] plan for linking New York and Washington with a public train system that had an effect on the local-- that fed off the agricultural land next to it. Somebody called it a horizontal skyscraper. Kenzo Tange's 1960 plan for the linearizing Tokyo and creating a greater use of the harbor, of the water.

Next. Stupid plans like this by Jonah Friedman to linearize Paris. Absolute madness-- should lock people up.

Next. The fascination with bringing together a number of mechanical forces-- train, bus, pedestrian, and the many schemas for maximizing density in New York. The stupidity of the Archigram proposal for moving. Archigram would have worked very well in Egypt where you had no investment in permanent sites, but you moved around. This is the grasshopper city, which moves around.

If there's anything we've learned historically, that the inertia of cities in modern times maintains this position. I've said this before, that you can count the number of cities. There are cities in trouble like Detroit, but there's no disappearance of cities, or very few, compared to previous times.

Next. It's called Buckminster Fuller and notion of using a single machine to cover the whole of the city of Manhattan.

Next. I think we end here. This is Lord Behrens' proposition for the AEG factory-- just about done-- in Berlin showing the wonderful correct place for every worker in the system.

And here the nightmare of Soweto outside Johannesburg, or part of Johannesburg, where race created a new town in which the machine model is exemplified par excellence with no pretension paid to anything else but the disposition of houses in free space. OK.